

REMARKS

STATUS OF THE CLAIMS

Claims 1-10 are pending in the application.

Claims 7 and 9 are objected to due to informalities.

It is understood that claims 1-3 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe (2002/0041618).

Claims 4, 5, 9, and 10 are objected to for being allowable if amended into independent form.

According to the foregoing, the claims are amended, new claim 11 is added, and, thus, the pending claims remain pending for reconsideration, which is respectfully requested.

No new matter is added in this amendment.

SPECIFICATION

The Office Action page 2 objects to the specification. According to the foregoing, the specification is amended taking into consideration the Examiner's comments. Withdrawal of the specification objection is respectfully requested.

CLAIM OBJECTIONS

The Office Action page 2 object to claims 7 and 9 for lack of antecedent basis. According to the foregoing, claims 7 and 9 are amended. Withdrawal of the claim objections are respectfully requested.

REJECTION

The independent claims are 1 and 6. New claim 11 provides an alternative recitation of the claimed present invention.

The Office Action relies on Watanabe to anticipatorily reject independent claim 1 and 6. Watanabe paragraphs 46-50, which is relied upon in the Office Action, discuss super-Gaussian optical pulses, spectral extension (Super-continuum), and a configuration for acquiring a certain optical component from the Super-continuum. It is submitted that Watanabe's discussion does

not relate to the claimed present invention, because Watanabe relates to extending the spectrum of each optical pulse with respect to the associated spectrum and ***a number of spectral components are taken out from thus obtained extended set of spectrum so as to generate optical pulse arrays of which the wavelengths are respectively different.***

According to the present invention, as recited in independent claims 1, 6 and new claim 11, ***“an optical pulse output from said optical pulse light source [is shaped] into a super Gaussian pulse of a third order or higher” and then “a spectrum of an optical pulse sequence composed of shaped optical pulses [is expanded]”*** such that the spectrum of an optical pulse sequence is evenly extendable by first shaping an optical pulse through employing an array of 3 or more order super-Gaussian optical pulses and ***then acquiring optical components based upon the shaped optical pulse by expanding the spectrum of shaped optical pulses.*** This ***difference results in difference in terms of obtained light waves, i.e., arrays of pulses in the case of Watanabe and continuous emission light waves*** in the case of the present invention. In contrast to Watanabe, according to the present invention, the spectral extension is performed for spectrum components that include those corresponding to the continuously changing intensity of an optical pulse array so as to be able to acquire continuous emission light waves of which the wavelengths are different respectively. For example, the present Application page 6, lines 2-8 and page 7, lines 6-18 support the claims.

Further, the following remarks are provided based upon the inventor's comments:

The present invention is concerned with a technology for generating plural continuous emission light waves from an optical pulse array by passing the optical pulse array through a non-linear medium for extending the associated optical spectrum. And a claimed inventive feature of the present invention lies, in particular, in ***employing an array of optical pulses of 3 or more order super-Gaussian waveform to shape an optical pulse so as to be able to extend its spectrum evenly*** - i.e., to generate a plurality of continuous emission light waves of which respectively associated optical powers are equal to each other - and then passing the shaped optical pulse through a non-linear medium to evenly extend the optical spectrum. In other words, in contrast to Watanabe, the claimed present invention as recited in independent claim 1, 6 and new claim 11, using claim 1 as an example, provides ***“an optical pulse shaping unit making a shape of an optical pulse output from said optical pulse light source into a super Gaussian pulse of a third order or higher, a spectrum expanding unit expanding a spectrum of an optical pulse sequence composed of shaped optical pulses.”***

If we assume the pulse interval associated with an array of optical pulses is T_0 , the spectrum obtained by a Fourier conversion of this pulse array becomes an assembly of a plurality of spectral lines of which the spectral interval is $f_0 (=1/T_0)$. Here, if ***we take out only one of these spectral lines, it will make continuous emission of light***, while ***if we take out a plurality of them together, it will make an array of pulses*** of which the associated pulse interval is T_0 .

Watanabe describes ***taking out a plurality of spectral lines together***, therefore, ***Watanabe is concerned with generating a pulse array***. From this fact we can say Watanabe is different from the present invention, which takes out spectral lines in a respectively separated manner at the same time and ***generating a plurality of beams of continuous emission light***. More particularly, it becomes possible to generate a plurality of beams of continuous emission light of mutually equal power by employing an array of 3 or more order super-Gaussian optical pulses. In other words, the claimed present invention's "an optical pulse shaping unit ***making a shape of an optical pulse output from said optical pulse light source into a super Gaussian pulse of a third order or higher***, a spectrum expanding unit ***expanding a spectrum of an optical pulse sequence composed of shaped optical pulses***" provides a benefit of generating a plurality of beams of continuous emission light of mutually equal power.

Thus, Watanabe cannot anticipate the claimed present invention, because Watanabe does not disclose, either expressly or inherently, each and every element of the claimed present invention's "an optical pulse shaper ***to shape an optical pulse output from said optical pulse light source into a super Gaussian pulse of a third order or higher***, a spectrum expander ***to expand a spectrum of the optical pulse sequence composed of shaped optical pulses from the optical pulse shaper***" (e.g., new independent claim 11). Watanabe is silent on "***to expand a spectrum of the optical pulse sequence composed of shaped optical pulses from the optical pulse shaper***, and ... ***to split the expanded spectrum of shaped optical pulses into light beams of respective frequencies***," because Watanabe discusses removing a number of spectral components together to remove intensity fluctuations or accumulated noise.

In view of the foregoing, withdrawal of the rejection of pending claims and allowance of pending claims is respectfully requested.


CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Respectfully submitted,
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